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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,672	04/30/2002	Yasushi Kurata	566.411991X00	7706

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ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER

DEO, DUY VU NGUYEN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 04/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/049,672		KURATA ET AL.	
	Examiner		Art Unit	
	DuyVu n. Deo		1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-33,35,38,41-51,54-57,59-72 and 85-100 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-33,35,38,41-51,54-57,59-72 and 85-100 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/30/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 26-33, 35, 41, 50-51, 56, 57, 62-64, 69-72, 89-92, 97-100 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 6,171,352).

Lee describes a polishing composition comprising: an oxidizing agent such as H₂O₂ (col. 3, line 5; col. 6, line 44); a protective-film-forming agent of benzotriazole and/or its derivatives (col. 4, line 19); an organic acid of glycolic acid (col. 3, line 23); deionized water (col. 4, line 11); 1-15 % wt of abrasive that can be any commercially available such as silica and alumina (claimed colloidal silica and alumina) (col. 2, line 66-col. 3, line 2; col. 3, line 67-col. 4, line 1); pH is from 1-6 (col. 4, line 31-40) (this would include claimed pH of 3 or less); and the oxidizing agent concentration is from 1-15 % by weight (col. 2, line 64), this would include concentration within claimed 0.01-3 %wt or 0.01-1.5 %wt. Unlike claimed invention, Lee doesn't suggest the oxidizing concentration is from 0.01-3 or 0.01-1.5 wt % or the pH is of 3 or less. However, the oxidizing concentration and the pH are a result-effective variables because Lee shows there are concentration and pH ranges. Therefore, it would have been obvious for one skilled in the art to determine the oxidizing concentration and the pH through routine experimentation in order to provide an optimum concentration and the pH for the polishing composition depending on the

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material being polishing. Lee's composition includes all the claimed components; therefore, it would have a property of being capable of polishing a barrier layer of Ta, Ta alloy, or Ta compound, which is a barrier layer for a conductor of Cu, Cu alloy or Cu oxide.

Referring to claims 27, 28, the composition further comprises polyacrylic acid copolymer or salts thereof (col. 2, line 47). This would read on claimed water-soluble polymer.

Referring to claim 35 Lee describes the method for polishing material including Cu and Ta (col. 4, line 38; col. 7, line 54).

Referring to claims 38, 51, 63, Lee's composition would have the polishing-rate ratio between different materials disclosed in claims 37, 38, 51, 52. Support for this presumption is found by the facts that the composition includes the same compounds with the same concentrations as that of the claims. The burden is upon the applicant to prove otherwise. *In re Fitzgerald*, 205 USPQ 594.

3. Claims 25, 38, 42-49, 54-55, 59-61, 65-68, 85-88, 93-96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as applied to claim 62 above, and further in view of Hardy et al. (US 6,238,592).

Referring to the average size of the abrasive, Hardy describes a average particle size of 50 nm or less (col. 9, line 65-col. 10, line 5). It would have been obvious for one skill in the art to determine the particle size in light of Hardy because Hardy further describes other processing parameters, such as average size of the abrasive, that is silent in Lee.

Even though applied prior art above does not describe standard deviation of the particle size distribution in a value of more than 5nm. It would have been obvious for one skill in the art

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to determine the standard deviation of the particle size distribution through test runs in order to provide a slurry for the polishing with a reasonable expectation of success.

Referring to claims 59, 65, 85, 93 Hardly further teaches that the polishing medium can contain abrasive or the abrasive can be fixed to abrasive article (col. 10, line 3-7). In the latter case, the polishing medium would not contain abrasive grains. This shows that either way would be equivalent and obvious at the time of the invention.

Referring to claims 54-57, even though applied prior art doesn't describe the pH of the oxidizing agent; however, it would be obvious to one skilled in the art that oxidizing agent pH can be any value as long as it provides the final pH of the slurry within the range as suggested by the applied prior art.

Response to Arguments

4. Referring to applicant's argument that Lee doesn't suggest the combination of relatively low pH and low amount of oxidizing agent, he teaches the pH is from 1-6 (col. 4, line 31-40) (this would include claimed pH of 3 or less); and the oxidizing agent concentration is from 1-15 % by weight (col. 2, line 64), this would include concentration of 1-3 %wt, which is within claimed 0.01-3 %wt. In response to applicant's argument that the claimed composition polish Ta-containing materials with high polishing rate, and/or with selectivity relative to polishing Cu-containing materials and/or silicon oxide, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Furthermore, the claims recites that the composition has a property of being capable of polishing Ta, Ta alloy, and Ta compound. Lee

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might not describes that the composition has all those advantages; however, his composition includes all the claimed components and ranges that are within claimed ranges; therefore, it would have a property of being capable of polishing a barrier layer of Ta, Ta alloy, or Ta compound, which is a barrier layer for a conductor of Cu, Cu alloy or Cu oxide.

Oath/Declaration

5. The Declaration by Yasushi Kurata is found unpersuasive because it doesn't compare the claimed subject matter with the closest prior art. See MPEP 716.02(e) [R-2]. Applicant has not shown that the polishing medium with claimed components and concentration provide an unexpected result over components and concentration of Lee's composition.

6. It refer(s) only to the system described in the above referenced application and not to the individual claims of the application. Thus, there is no showing that the objective evidence of nonobviousness is commensurate in scope with the claims. See MPEP § 716. The examples show the composition having abrasive grains while some of the independent claims recites the composition having no abrasives grains.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DuyVu n. Deo whose telephone number is 571-272-1462. The examiner can normally be reached on 6 am -2:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Primary Examiner
Duy-Vu N Deo
4/19/06

